

EPA Region 5 Records Ctr.



345523

November 7, 2003
File 0081300-04-15

Mr. John Seymour, P.E.
YCRG Project Coordinator
GeoSyntec Consultants
55 W. Wacker Drive, Suite 1100
Chicago, IL 60601

**Subject: September 2003 Groundwater Monitoring Report
Yeoman Creek Landfill Superfund Site
Waukegan, Illinois**

Dear Mr. Seymour:

Weaver Boos Consultants, Inc. (Weaver Boos), sub-consultant to TJ Lambrecht Construction, Inc., (TJ Lambrecht) has completed the above referenced monitoring for the Yeoman Creek Landfill Superfund (YCLS) Site located in Waukegan, Illinois. The Yeoman Creek Superfund Site includes Yeoman Creek Landfill, Edwards Field Landfill, and Rubloff Landfill.

September 2003 Monitoring Event

Weaver Boos was present at the YCLS Site to conduct the necessary fieldwork to collect field parameters for groundwater and leachate samples and groundwater level measurements from September 15, 2003 to September 18, 2003. The subject monitoring event included a total of 74 monitoring locations as follows: 43 groundwater wells, 3 leachate wells, and 28 landfill gas probes (see **Figure 1**). A summary of the September 2003 Monitoring Event is provided as **Table 1**. Pursuant to United States Environmental Protection Agency (USEPA) Correspondence dated May 30, 2002, only field parameters and groundwater elevation measurements were obtained during this event. Groundwater elevation measurements were collected from each of the 74 monitoring locations with the exception of three landfill gas probes. Landfill gas probe LFG-110 is located under a tire chip pile and is presently inaccessible, LFG-105 was previously removed from the monitoring network to allow for placement of a soil stockpile, and LFG-106

had an obstruction in the well, which prevented depth to water level measurements from being obtained. TJ Lambrecht was notified of this situation following the June 2003 monitoring event. Efforts were made to clear the obstruction, however the obstruction could not be removed. Field parameters were collected from 43 groundwater wells and 3 leachate wells.

Field work was performed in accordance with the site specific Field Sampling Plan (FSP) prepared by GeoSyntec Consultants, dated August 2001, and the Pre-Design Data Collection Activities Quality Assurance Project Plan (QAPjP) prepared by Parsons Engineering Sciences, Inc. dated August 1999.

A representative from R.F. Weston was present on-site to oversee sampling activities on behalf of the USEPA.

Groundwater and Leachate Sampling

Depth to groundwater measurements were taken over a two-day period at the beginning of the sampling event, prior to purging any of the wells so as to obtain measurements, providing a more representative depiction of the groundwater and leachate flow in the vicinity of the site (see **Table 2**).

The wells were purged with dedicated tubing and a peristaltic pump using a low-flow technique. A flow through cell was used to measure pH, temperature, conductivity, dissolved oxygen, and oxidation-reduction potential. Turbidity was measured using a separate turbidity meter. A colorimeter and mixing agents were used to field test for ferrous iron in accordance with the FSP. The field measurements collected from each well and are included on **Table 3**.

Field parameters were collected from 22 Shallow Zone monitoring wells, 20 Lower Outwash monitoring wells, 1 bedrock well, and 3 leachate monitoring wells (see **Table 1**). Samples were analyzed for field parameters field pH, specific conductivity, dissolved oxygen, ferrous iron, temperature, turbidity, and oxidation-reduction potential.

Potentiometric Surface Maps

The depth to groundwater data from the wells screened within the lower outwash was used to generate a groundwater potentiometric surface map. As shown on **Figure 2**, groundwater flow for the lower outwash is generally towards the east.

The depth to groundwater data from the leachate wells and the landfill gas probes was used to create **Figure 3** (Potentiometric Surface Map for Leachate Wells). The leachate elevation contours at Edwards Field generally show a radial leachate gradient directed outward from the landfill. The leachate elevation contours at East Yeoman Creek Landfill also generally show a radial leachate flow directed outward from the landfill.

We trust that this information is sufficient for your needs at this time. If you have any questions, comments, or suggestions regarding the data presented in this groundwater report, please contact us at your convenience.

Very truly yours,

Weaver Boos Consultants, Inc.



James Reich
Staff Scientist



Michael B. Maxwell, LPG
Project Manager

Attachments: Tables
Figures

TABLES

Tables

Table 1
Summary of September 2003 Quarterly Monitoring
Yeoman Creek Landfill
Waukegan, Illinois

Sample Description	Water Levels	Field Parameters
<i>Groundwater Monitoring Wells</i>		
MW-301	X	X
MW-G	X	X
MW-B	X	X
MW-105	X	X
MW-106	X	X
MW-107	X	X
MW-108	X	X
MW-101	X	X
MW-102	X	X
MW-109	X	X
MW-110	X	X
MW-111	X	X
MW-A	X	X
MW-103	X	X
MW-104	X	X
MW-112	X	X
MW-217	X	X
MW-210	X	X
MW-209	X	X
MW-216	X	X
MW-E1	X	X
MW-E2	X	X
MW-C	X	X
MW-D	X	X
MW-211	X	X
MW-212	X	X
MW-215	X	X
MW-213	X	X
MW-214	X	X
MW-201	X	X
MW-202	X	X
MW-203	X	X
MW-204	X	X
MW-205	X	X
MW-206	X	X
MW-207	X	X
MW-208	X	X
MW-401	X	X
MW-402	X	X
MW-403	X	X
MW-405	X	X
MW-406	X	X
MW-F	X	X

Table 1
Summary of September 2003 Quarterly Monitoring
Yeoman Creek Landfill
Waukegan, Illinois

Sample Description	Water Levels	Field Parameters
<i>Leachate Monitoring Wells</i>		
LW-101	X	X
LW-102	X	X
LW-103	X	X
<i>Landfill Gas Probes</i>		
LFG-101	X	
LFG-102	X	
LFG-103	X	
LFG-104	X	
LFG-105	Removed	
LFG-106	Damaged	
LFG-107	X	
LFG-108	X	
LFG-109	X	
LFG-110	Inaccessible	
LFG-111	X	
LFG-201	X	
LFG-202	X	
LFG-203	X	
LFG-204	X	
LFG-205	X	
LFG-206	X	
LFG-207	X	
LFG-208	X	
LFG-211	X	
LFG-216	X	
LFG-218	X	
LFG-219	X	
LFG-220	X	
LFG-221	X	
LFG-222	X	
LFG-223	X	
LFG-224	X	

Table 2
Summary of Groundwater Elevations
September 2003 Groundwater Monitoring Event
Yeoman Creek Landfill
Waukegan, Illinois

Location ID	Top of PVC* (MSL)	Total Well Depth* (feet)	Depth to Water 9-03 (feet)	Groundwater Elevation 9-03 (MSL)
Shallow Zone Wells				
<i>Lacustrine Clays, Organics, Sand Lenses</i>				
MW-204	662.45	22.67	17.65	644.80
MW-206	663.75	21.83	10.50	653.25
MW-208	659.31	21.31	12.47	646.84
MW-402	657.25	20.28	5.55	651.70
<i>Fluviolacustrine Sands</i>				
MW-102	653.53	23.77	8.35	645.18
MW-104	652.53	25.30	7.48	645.05
MW-106	654.96	20.26	7.94	647.02
MW-107	656.46	21.59	10.79	645.67
MW-108	654.59	25.22	9.39	645.20
MW-110	653.18	25.25	8.13	645.05
MW-111	655.64	25.27	9.98	645.66
MW-202	660.01	27.82	10.51	649.50
MW-210	651.81	26.15	6.52	645.29
MW-211	658.81	41.93	13.50	645.31
MW-212	658.87	18.79	13.60	645.27
MW-214	653.54	24.29	7.03	646.51
MW-215	654.80	20.27	6.35	648.45
MW-216	657.47	24.77	12.30	645.17
<i>Upper Outwash</i>				
MW-217	651.68	17.84	6.38	645.30
MW-406	661.19	32.91	19.09	642.10
MW-E1	664.75	33.81	22.31	642.44
MW-G	664.96	24.63	8.61	656.35

Note: Top of PVC Elevations for groundwater wells provided by Parsons Engineering Sciences, Inc. except for wells MW-112 and MW-217 which were installed and surveyed by Weaver Boos Consultants, Inc. Water level measurements obtained on September 15 and 16, 2003.

Table 2
Summary of Groundwater Elevations
September 2003 Groundwater Monitoring Event
Yeoman Creek Landfill
Waukegan, Illinois

Location ID	Top of PVC* (MSL)	Total Well Depth* (feet)	Depth to Water 9-03 (feet)	Groundwater Elevation 9-03 (MSL)
Lower Outwash Wells				
MW-101	653.63	40.25	8.49	645.14
MW-103	652.19	50.28	7.09	645.10
MW-105	654.79	45.37	9.03	645.76
MW-109	653.49	64.59	10.24	643.25
MW-112	649.45	39.87	4.41	645.04
MW-201	659.80	57.36	14.82	644.98
MW-203	663.00	68.51	20.73	642.27
MW-205	664.13	74.55	21.59	642.54
MW-207	658.50	47.02	15.85	642.65
MW-209	651.75	46.91	6.69	645.06
MW-213	653.89	47.11	8.80	645.09
MW-301	678.74	45.36	23.01	655.73
MW-401	657.53	60.77	15.12	642.41
MW-405	661.82	62.94	19.79	642.03
MW-A	655.54	50.18	9.75	645.79
MW-B	654.49	58.74	8.57	645.92
MW-C	655.31	49.51	11.83	643.48
MW-D	655.33	36.96	10.07	645.26
MW-E2	664.71	53.92	22.55	642.16
MW-F	660.30	43.27	18.27	642.03
Bedrock Well				
MW-403	657.63	174.75	106.53	551.10
Leachate Wells				
LW-101	655.70	15.09	10.00	645.70
LW-102	656.94	13.31	9.92	647.02
LW-103	654.93	15.11	7.32	647.61

Note: Top of PVC Elevations for groundwater wells provided by Parsons Engineering Sciences, Inc. except for wells MW-112 and MW-217 which were installed and surveyed by Weaver Boos Consultants, Inc.
Water level measurements obtained on September 15 and 16, 2003.

Table 2
Summary of Groundwater Elevations
September 2003 Groundwater Monitoring Event
Yeoman Creek Landfill
Waukegan, Illinois

Location ID	Top of PVC* (MSL)	Total Well Depth* (feet)	Depth to Water 9-03 (feet)	Groundwater Elevation 9-03 (MSL)
Landfill Gas Probes				
LFG-101	652.77	10.03	9.28	643.49
LFG-102	654.01	10.13	7.54	646.47
LFG-103	655.37	10.13	DRY	<645.24
LFG-104	654.23	10.15	DRY	<644.08
LFG-105	654.55	8.85	REMOVED	
LFG-106	653.93	9.06	OBSTRUCTED	
LFG-107	652.64	5.54	DRY	<647.10
LFG-108	654.44	9.24	OBS. at 4.04'	<650.40
LFG-109	652.39	7.68	6.78	645.61
LFG-110	652.19	9.92	TEMPORARILY INACCESSIBLE	
LFG-111	654.01	10.22	DRY	<643.79
LFG-201	660.68	8.24	DRY	<652.44
LFG-202	662.33	9.98	6.32	656.01
LFG-203	663.76	10.06	DRY	<653.70
LFG-204	658.34	10.33	9.03	649.31
LFG-205	656.72	10.28	DRY	<646.44
LFG-206	659.46	10.35	DRY	<649.11
LFG-207	657.02	10.32	DRY	<646.70
LFG-208	657.80	10.12	DRY	<647.68
LFG-211	660.81	7.48	5.27	655.54
LFG-216	656.62	10.20	6.58	650.04
LFG-218	662.19	6.73	DRY	<655.46
LFG-219	661.83	10.10	9.41	652.42
LFG-220	660.32	10.16	DRY	<650.16
LFG-221	660.04	10.21	DRY	<649.83
LFG-222	663.38	7.87	DRY	<655.51
LFG-223	660.83	9.82	8.82	652.01
LFG-224	665.28	9.97	DRY	<655.31

Note: Top of PVC Elevations for groundwater wells provided by Parsons Engineering Sciences, Inc. except for wells MW-112 and MW-217 which were installed and surveyed by Weaver Boos Consultants, Inc.

Water level measurements obtained on September 15 and 16, 2003.

If the gas probe was dry, then value shown is less than the bottom of the probe.

Table 3
Summary of Analytical Results
September 2003 Groundwater Monitoring Event
Yeoman Creek Landfill
Waukegan, Illinois

Parameter Name	Units	35 IAC 620.410 Class I Standard	Federal MCL	MW-101	MW-102	MW-103	MW-104	MW-105	MW-106	MW-107	MW-108	MW-109	MW-110	MW-111	MW-112	MW-201	MW-202	MW-203	MW-204
				LO	SZ	LO	SZ	LO	SZ	SZ	SZ	LO	SZ	SZ	LO	LO	SZ	LO	SZ
Field Parameters																			
Dissolved Oxygen	mg/L	NA	NA	9.08	2.82	6.64	3.34	5.99	5.58	8.92	4.81	4.56	4.23	6.47	16.74	3.32	3.66	6.02	4.23
Ferrous Iron	ppm	NA	NA	0.83	8.52	0.59	4.84	2.13	21.68	2.76	1.22	2.63	5.38	16.12	0.51	2.90	3.46	0.04	1.80
pH	s.u.	6.5-9.0	NA	7.6	7.6	8.3	7.8	7.4	7.0	7.4	7.8	7.5	7.2	7.2	7.5	8.2	8.0	8.6	8.1
Redox Potential	mV	NA	NA	-21	-73	93	-91	-70	-44	-63	-44	-83	-36	-42	-69	-65	-72	88	-80
Specific Conductivity	umhos	NA	NA	1960	2070	1890	3320	1610	2570	1140	725	2013	2010	2150	1990	2230	6750	516	2410
Temperature	deg. C	NA	NA	12.94	13.01	13.55	12.97	12.47	13.96	13.91	12.42	12.56	13.11	12.87	10.99	12.28	15.10	13.73	13.77
Turbidity	ntu	NA	NA	22.50	9.82	20.90	51.00	9.12	9.23	25.10	12.20	13.20	10.00	9.38	8.46	29.40	25.60	16.90	21.80

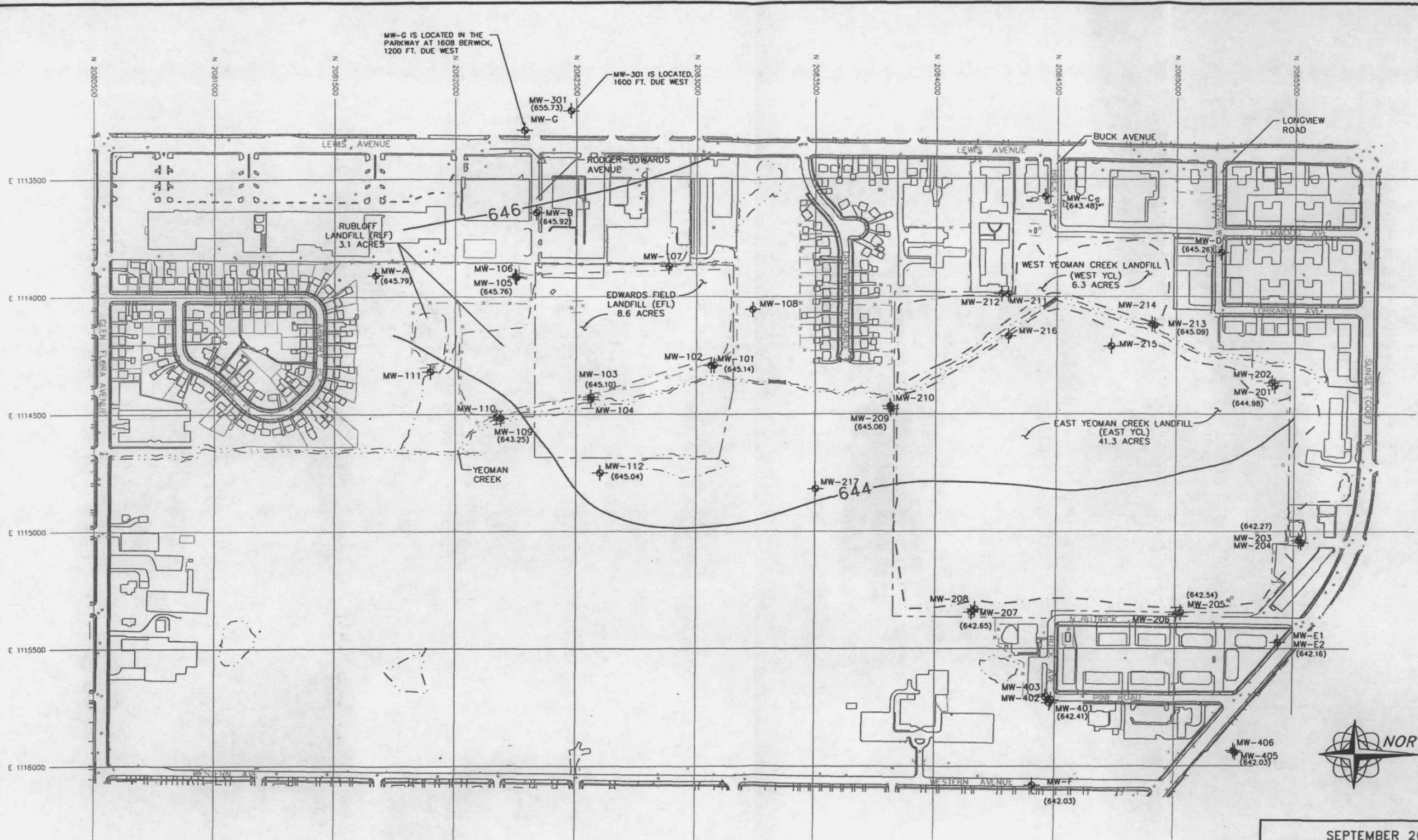
Parameter Name	Units	35 IAC 620.410 Class I Standard	Federal MCL	MW-205	MW-206	MW-207	MW-208	MW-209	MW-210	MW-211	MW-212	MW-213	MW-214	MW-215	MW-216	MW-217	MW-301	MW-401	MW-402
				LO	SZ	LO	SZ	LO	SZ	SZ	SZ	LO	SZ	SZ	SZ	SZ	LO	LO	SZ
Field Parameters																			
Dissolved Oxygen	mg/L	NA	NA	4.94	3.62	5.17	3.32	6.68	5.48	5.22	10.44	5.52	4.81	5.35	5.54	5.93	7.93	5.57	3.47
Ferrous Iron	ppm	NA	NA	3.83	3.68	2.01	9.78	0.41	4.95	2.64	5.28	3.46	2.65	4.61	9.96	8.88	0.27	1.82	1.35
pH	s.u.	6.5-9.0	NA	8.1	7.7	7.8	7.6	8.0	7.8	7.4	7.4	7.6	7.8	7.4	7.6	8.6	6.9	8.1	7.9
Redox Potential	mV	NA	NA	-66	-102	-16	-51	-81	-57	-75	-75	-42	-78	-67	-75	-114	150	-4	14
Specific Conductivity	umhos	NA	NA	1920	3950	1900	1590	1790	2150	2020	1170	2100	1650	765	1750	1410	368	1800	2370
Temperature	deg. C	NA	NA	13.45	16.09	12.65	14.18	11.82	12.06	14.85	16.90	12.33	12.79	12.28	13.69	11.21	13.19	11.97	12.34
Turbidity	ntu	NA	NA	52.60	51.70	12.50	16.10	11.50	19.80	13.90	19.40	10.90	13.30	10.10	12.60	81.80	11.20	12.60	13.10

Parameter Name	Units	35 IAC 620.410 Class I Standard	Federal MCL	MW-403	MW-405	MW-406	MW-A	MW-B	MW-C	MW-D	MW-E1	MW-E2	MW-F	MW-G	LW-101	LW-102	LW-103
				BR	LO	SZ	LO	LO	LO	LO	SZ	LO	LO	SZ	LE	LE	LE
Field Parameters																	
Dissolved Oxygen	mg/L	NA	NA	6.31	4.13	2.84	6.51	5.89	5.53	4.54	4.53	4.16	5.63	5.34	0.69	5.56	3.67
Ferrous Iron	ppm	NA	NA	0.09	0.18	1.20	0.26	0.45	3.74	1.72	2.84	0.12	3.53	3.49	12.48	13.12	4.36
pH	s.u.	6.5-9.0	NA	8.6	8.2	7.5	7.7	7.3	8.0	7.4	7.6	8.2	7.8	7.4	7.2	6.5	6.9
Redox Potential	mV	NA	NA	81	35	-64	103	40	-60	-70	-37	111	-66	-56	-84	-124	-138
Specific Conductivity	umhos	NA	NA	624	1820	2520	1300	574	940	3200	2590	649	1900	634	895	2030	2650
Temperature	deg. C	NA	NA	12.54	13.03	13.32	15.32	16.40	14.65	14.17	13.51	13.73	12.49	15.12	12.14	13.23	10.89
Turbidity	ntu	NA	NA	11.50	13.90	996.00	9.36	67.60	859.00	28.90	14.30	13.40	67.10	34.20	81.70	11.20	22.70

Notes:
 NA - Not Applicable
 NS - Not Sampled
 BR - Bedrock
 LE - Leachate
 LO - Lower Outwash
 SZ - Shallow Zone

FIGURES

Figures



MW-G IS LOCATED IN THE PARKWAY AT 1608 BERWICK, 1200 FT. DUE WEST

MW-301 IS LOCATED 1600 FT. DUE WEST

NOTE: DRAWING ADAPTED FROM DRAWING NO. 2 OF 29 FROM GEOSYNTEC CONSULTANTS, JOB No. 000864-8.4, DATED APRIL 27, 2001 (REMEDIAL DESIGN, YEOMAN CREEK LANDFILL SUPERFUND SITE, WAUKEGAN, ILLINOIS).

* GROUNDWATER ELEVATION FOR MW-C APPEARS TO BE ANOMALOUSLY LOW IN RELATION TO SURROUNDING DATA, THEREFORE IT WAS NOT UTILIZED WHEN CREATING THIS POTENTIOMETRIC SURFACE MAP.

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LEGEND

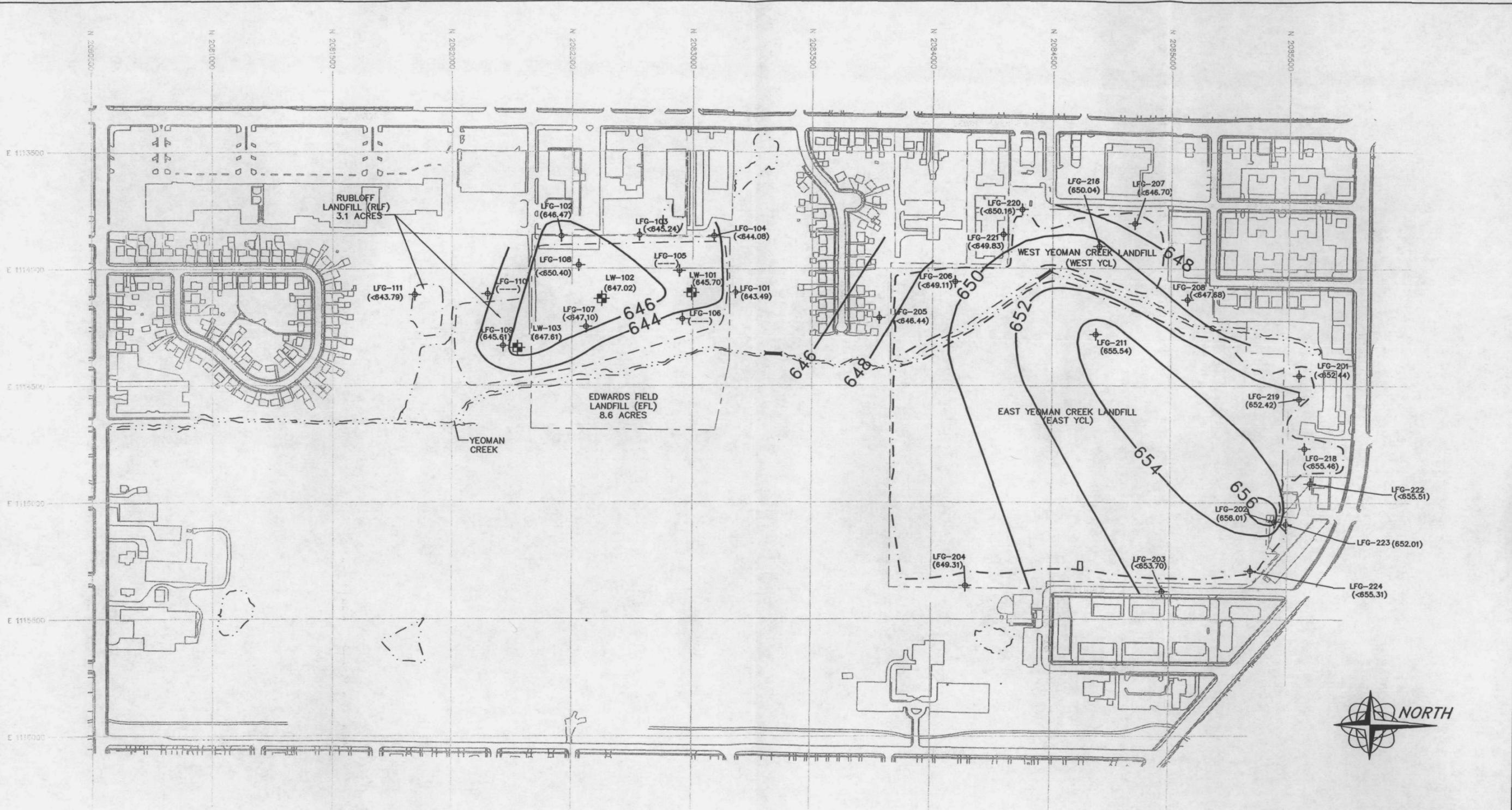
	APPROXIMATE LIMIT OF WASTE		EXISTING TREE
	APPROXIMATE PROPERTY LINE		HOUSE OR STRUCTURE
	GROUNDWATER MONITORING WELL		SIDEWALK
	TREE LINE		EXISTING FENCE
	EXISTING ROAD		GROUNDWATER ELEVATION CONTOUR LINE

**SEPTEMBER 2003
POTENTIOMETRIC SURFACE MAP
FOR LOWER OUTWASH WELLS**

**YEOMAN CREEK LANDFILL
WAUKEGAN, ILLINOIS**

Weaver Boos Consultants, Inc.

GRIFFITH, IN FORT WORTH, TX	CHICAGO, IL (312) 922-1030	DOWNERS GROVE, IL SPRINGFIELD, IL
DRAWN BY: RAK	DATE: 09/30/03	FILE: 0081-300-04
REVIEWED BY: JR	CAD:0903POT.DWG	FIGURE 2



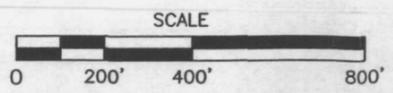
NOTES

- 1.) LEACHATE WELL LW-201, LW-202, LW-203, AND LW-204 WERE DECOMMISSIONED PRIOR TO THE JUNE 2002 EVENT.
- 2.) DRAWING ADAPTED FROM DRAWING NO. 2 OF 29 FROM GEOSYNTEC CONSULTANTS, JOB No. 000864-8.4, DATED APRIL 27, 2001 (REMEDIAL DESIGN, YEOMAN CREEK LANDFILL SUPERFUND SITE, WAUKEGAN, ILLINOIS).
- 3.) DRY WELLS ARE SHOWN WITH ELEVATIONS < THE BOTTOM OF THE WELL.
- 4.) UNABLE TO OBTAIN LEACHATE LEVELS FROM LFG-106 (DAMAGED), LFG-105 (REMOVED), AND LFG-110 (TEMPORARILY INACCESSIBLE).

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LEGEND

- EXISTING GROUND ELEVATION
- APPROXIMATE LIMIT OF WASTE
- APPROXIMATE PROPERTY LINE
- LEACHATE CONTOUR
- LEACHATE WELL
- GAS PROBE
- EXISTING ROAD
- HOUSE OR STRUCTURE
- SIDEWALK
- EXISTING FENCE



**SEPTEMBER 2003
POTENTIOMETRIC SURFACE MAP
FOR LEACHATE WELLS
YEOMEN CREEK LANDFILL
WAUKEGAN, ILLINOIS**

Weaver Boos Consultants, Inc.
GRIFITH, IN CHICAGO, IL DOWNERS GROVE, IL
 FORT WORTH, TX (312) 922-1030 SPRINGFIELD, IL

DRAWN BY: RAK	DATE: 09/30/03	FILE: 0081-300-04
REVIEWED BY: JR	CAD:903LEACHATE.DWG	FIGURE 3